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10/810,457	03/26/2004	Ranganathan Krishnan	040213/QUALP841US	9317
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Amin, Turocy & Calvin LLP 1900 E. 9th Street 24th Floor, National City Center Cleveland, OH 44114			EXAMINER MOUTAOUAKIL, MOUNIR	
			ART UNIT 2619	PAPER NUMBER
			NOTIFICATION DATE 04/08/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/810,457	Applicant(s) KRISHNAN ET AL.	
	Examiner MOUNIR MOUTAOUKIL	Art Unit 2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed on 01-04-2008 has been entered and considered.

Claims 1-27 are pending in this application.

Claims 1-27 remain rejected as discussed below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4-6, 8, 11-16, 18-20, 22, and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo (US 7,184,767) in view of Cruz et al (US 2006/0046658). Hereinafter referred to as Cruz.

Regarding claims 1, 11, 13, 25 and 27. Gandolfo discloses a method of scheduling communications. The method comprises scheduling an inter-piconet transmission between first transmitting and receiving terminals (fig.6C, the communication between A-2 and B-2) and scheduling an intra-piconet transmission between second transmitting and receiving terminals (fig.3, the devices, within piconet, communicate with each other. 321 and 325). Gandolfo discloses all the limitations of the claimed invention with the exception of scheduling the power level for the inter-piconet and intra-piconet transmission that will satisfy the quality parameters of the receiving terminals; moreover Gandolfo does not disclose that the intra-piconet transmission is

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scheduled simultaneously with the inter-piconet transmission. However, Cruz discloses a method of scheduling the power level that will satisfy every receiver within the network. Cruz's network is divided into multiple clusters in communication with each other (paragraph [0017]). Moreover, Cruz discloses that the clusters are enabled to transmit simultaneously (paragraph [0099], clusters are interpreted as piconets). Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to implement the method of scheduling the power level of the transmission and to enabling clusters simultaneously, as taught by Cruz, into the piconet structure of Gandolfo for the purpose of improving the quality of communication between devices and the energy efficiency, as suggested by Cruz.

Regarding claim 2. The method of Gandolfo in view of Cruz further comprises transmitting the schedule for the inter-piconet transmission to the first transmitting terminal (fig.6C, 510a, 530, and 522a), and transmitting the schedule for the intra-piconet transmission to the second transmitting terminal (fig.3. 310, 321, and 330).

Regarding claims 4 and 18. Gandolfo and Cruz disclose a method wherein the first transmitting terminal and the second transmitting and receiving terminals are members of a first piconet (fig.6C, 521a, 523a, and 522a, col.8, lines 15-16, the element of the piconets behave just as illustrated in fig.3), and the first receiving terminal is a member of a second piconet (fig.6C, 522b).

Regarding claims 5 and 19. Gandolfo and Cruz disclose a method wherein the first transmitting terminal and the second transmitting and receiving terminals are members of a first piconet (fig.6C, the first transmitting element 510a, second

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transmitting element 523a, and the second receiving element 521a. col.8, lines 15-16, the element of the piconets behave just as illustrated in fig.3), and the first receiving terminal is a member of the first piconet and a second piconet (fig 6C, 522a is a member of the first and second piconet col.8, lines 15-16, the elements of the piconets behave just as illustrated in fig.3).

Regarding claims 6 and 20. Gandolfo and Cruz disclose a method wherein the inter-piconet transmission comprises information (fig.6C), the information being destined for a third terminal (522b), the third terminal being a member of the second piconet (560b), but not a member of the first piconet (fig.6C), the method further comprising scheduling a transmission of the information from the first receiving terminal to the third terminal (information is transmitted from 510a to 522b through 522a).

Regarding claims 8, 12, 22 and 26. Gandolfo and Cruz disclose a wherein the first transmitting terminal and the second transmitting and receiving terminals are members of a first piconet (fig.6C elements 522a, 521a, 523a), and the first receiving terminal is a member of a second piconet (505a), the method further comprising transmitting the inter-piconet transmission schedule to a third terminal in the second piconet (510b), the third terminal being responsible for scheduling intra-piconet transmissions in the second piconet (510b is the second piconet's controller).

Regarding claim 14. Gandolfo and Cruz disclose a method that further comprises a transmitter configured to transmit the schedule of the inter-piconet transmission to the first transmitting terminal (each piconet has a master or a controller that organizes the communication between devices, fig.3, and 6C), and transmit the schedule of the of

intra-piconet transmission to the second transmitting terminal (each piconet has a master or a controller that organizes the communication between devices, fig.3, and 6C)

Regarding claim 15. Gandolfo and Cruz a method that further comprises a transceiver having the transmitter (fig.3, 6C every device in the piconets is a wireless device), and a user interface configured to allow a user to engage in communications with another terminal through the transceiver (fig.3, 6C the devices are wireless devices engaged in a communication with the master or the other devices wirelessly).

Regarding claim 16. Gandolfo and Cruz disclose a method wherein the user interface comprises a keypad, a display, a speaker and a microphone (col.8, lines 15-17. The devices in the piconet correspond to the elements of Fig.3, which a PDA is one of them).

4. Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo in view of Cruz as applied to claim1 above, and further in view of Agrawal et al (US 6,072,990). Hereinafter referred to as Agrawal.

Regarding claims 3 and 17. Gandolfo and Cruz do not explicitly disclose that the quality parameter comprises a carrier-to-interference ratio. However, Agrawal discloses, in a wireless network, a method that measures the quality of a transmission using various channel quality metrics such as carrier-to-interference (C/I) ratio (admitted prior art, col.1, lines 27-37). Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to implement the carrier-to-interference (C/I) ratio, as suggested by Agrawal, into the network of Gandolfo and Cruz for the purpose of improving or maintaining the quality of transmission between devices.

5. Claims 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo in view of Cruz as applied to claims 1 and 13 above, and further in view of Palin et al (US 2003/0083015). Hereinafter referred to as Palin.

Regarding claims 7 and 21. Gandolfo and Cruz do not explicitly disclose that a scheduled power level for the transmission, between terminals, is a function of path-loss related to the received information. However, Palin discloses, in a communication system, a method of scheduling and measuring the power level based on the power loss information. Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to implement the method of assigning the power level based on the path loss information, as taught by Palin (paragraph [0042] and [0044]), into the communication system of Gandolfo in view of Cruz for the purpose of improving QOS and employing transmission power efficiently.

6. Claims 9 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo in view of Cruz as applied to claims 1 and 13 above, and further in view of Umeda et al (US 5,920,817). Hereinafter referred to as Umeda.

Regarding claims 9 and 23, Gandolfo and Cruz disclose all the limitations of the claimed invention. Gandolfo and Cruz do not explicitly disclose that the inter-piconet transmission has a first spreading code and the intra-piconet transmission has a second spreading code; moreover, the first spreading code is different from the second spreading code. However, Umeda discloses, in a mobile communication system, a method where a device is capable of communicating with n different elements using n different spreading codes (col.7, lines 6-27). Thus, it would have been obvious to a

person of ordinary skill in the art at the time of the invention to implement the method of having different spreading codes for different entities and networks, as suggested by Umeda, into the networks of Gandolfo in view of Cruz for the purpose of enhancing transmissions security.

7. Claims 10 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo in view of Sun et al (Interference-aware MAC scheduling and SAR policies for blue tooth scatternets). Hereinafter referred to as Sun.

Regarding claims 10 and 24. Gandolfo discloses a method of scheduling communications. The method comprises receiving in a first piconet information relating to a scheduled inter-piconet transmission from a second piconet (fig.6C. Inter-piconet communication is established); and scheduling a plurality of intra-piconet transmissions in the first piconet (fig.6C, each piconet has the same structure as of the piconet of fig.3).

Gandolfo discloses all the limitations of the claimed invention with the exception that no intra-piconet transmissions are scheduled simultaneously with the inter-piconet transmission. However, Sun discloses a method where the inter-piconet and intra-piconet transmissions are not simultaneous because the slave nodes take turns in transmitting information (page 11, from left column, line 44 to right column, Line 21, and 27-29; page 13, left column, lines 28-31, and right column, lines 28-39). Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention implement the interference aware method of Sun into the piconet system of Gandolfo for the purpose of avoiding or reducing interference between transmissions.

Response to Arguments

8. Applicant's arguments filed 01-04-2008 have been fully considered but they are not persuasive.

9. In the remarks, applicants contend that prior art of record does not teach a method for scheduling communications between first and second terminals in an intra-piconet and scheduling communications between first and second terminal in an inter-piconet.

Examiner respectfully disagrees, the prior art of Gandolfo teaches a method of scheduling intra-piconet transmission between transmitting and receiving terminals. As illustrated in Fig.3, devices (321 and 325), within piconet, communicate with each other. Furthermore, Gandolfo states that "We would prefer that while device one 321 was transmitting, device five 325 was the only device that was listening. This is basically a TDMA approach. Since the broadcast medium is wireless, when one device is transmitting the system has to limit who else can use the channel" (Col.4, lines 27-37). Therefore, Gandolfo allocates/schedules a specific time for 321 and 325 to communicate with each other and share the bandwidth. Moreover, the same concept is applied in the inter-piconet communication, Gandolfo states that the piconets 505a, 505b, and 505c behave as corresponding elements shown in fig.3 (Col.8, lines 15-17). Thus, the method has to allocate/schedule specific time for devices to communicate with each other. Moreover, every time devices communicate with each other, a controller coordinates the sharing of the bandwidth used between them using TDMA.

In the remarks, applicants contend that the prior art of record does not teach or suggest scheduling power levels for the inter-piconet and intra-piconet transmissions that satisfy quality parameters of receiving terminals and further fails to teach or suggest that the intra-piconet transmission is scheduled simultaneously with the inter-piconet transmission.

Examiner respectfully disagrees, the prior art of Cruz discloses optimal link scheduling and power control for single and multi-hop wireless networks. Cruz discloses the total power is the parameter and the total power is minimized for the network, including the receiving terminals. Therefore, the receiving terminals power is scheduled and regulated to satisfy the federal government regulations, as suggested by Cruz. Moreover, Cruz discloses that it is energy efficient to enable all the clusters simultaneously. Therefore, all the clusters transmissions are enabled simultaneously to improve the network efficiency.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Note: During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." >The Federal Circuit's *en banc* decision in *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005) expressly recognized that the USPTO employs the "broadest

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reasonable interpretation" standard: The Patent and Trademark Office ("PTO") determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction "in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 [, 70 USPQ2d 1827] (Fed. Cir. 2004).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the

references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

When responding to this office action, applicants are advised to clearly point out the patentable novelty which they think the claims present in view of the state of the art disclosed by the references cited or the objections made. Applicants must also show how the amendments avoid such references or objections. See 37C.F.R 1.111(c). In addition, applicants are advised to provide the examiner with the line numbers and pages numbers in the application and/or references cited to assist examiner in locating the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOUNIR MOUTAOUAKIL whose telephone number is (571)270-1416. The examiner can normally be reached on Monday-Thursday (1pm-4:30pm) eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mounir Moutaouakil/
Examiner, Art Unit 2619

/Hassan Kizou/
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